

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1405

[5433]-11

M.Sc. - I

ZOOLOGY

**ZY - 101 : Biochemistry
(2008 Pattern) (Semester - I)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*

Q1) a) Explain the role of branching and debranching enzymes in glycogen synthesis. **[20]**

b) Explain salvage pathway in nucleotide metabolism.

Q2) a) Write about the clinical and industrial applications of enzymes. **[20]**

b) Describe the structural basis and functional significance of Hexokinase.

Q3) Write short notes on : **[20]**

- a) Enzyme turn over.
- b) Prochiral nature of citrate.
- c) Fate of pyruvate.
- d) Metal cofactors.

Q4) a) Explain the inosinic pathway for purine nucleotide synthesis. **[20]**

b) Give the reactions of amino acids with reference to amino group.

Q5) a) Describe in detail the role of carnitine shuttle in lipid metabolism. **[20]**

b) Explain in detail the Electron transport chain.

P.T.O.

Q6) Give the structure of the following. **[20]**

- a) Glycogen
- b) Lecithin
- c) β -pleated structure of protein
- d) Chitin

Q7) Write the following reactions in detail. **[20]**

- a) Citrate \rightleftharpoons Isocitrate
- b) α -ketoglutarate \rightarrow Succinyl COA
- c) Succinate \rightarrow Fumarate
- d) Malate \rightarrow Oxaloacetate

Q8) a) Discuss the role of pyruvates dehydrogenase complex in the formation of Acetyl COA. **[10]**

b) Explain Reversible Inhibition. **[10]**



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1406

[5433]-12

M.Sc.

ZOOLOGY

ZY-102 : a) Genetics, ZY-102

b) English for Scientists

(2008 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Use of calculator is allowed.*

SECTION-I

a) Genetics

Q1) What do you mean by Epistasis? Explain in detail dominant and recessive epistasis giving suitable examples. Add a note on hypostasis. **[20]**

Q2) a) Describe different types of vectors used in recombinant DNA technology. **[10]**

b) Explain the organization, regulation and mutational analysis of Lactose operon. **[10]**

Q3) a) Explain the genetic basis of quantitative traits. And state the effect of environment on quantitative traits. **[10]**

b) Explain linkage. Add a note on chromosome mapping. **[10]**

Q4) Answer any two of the following : **[20]**

- a) DNA sequencing
- b) Explain classical and modern concept of gene
- c) Somatic cell genetics

P.T.O.

SECTION-II

b) English for Scientists

Q5) How to write the 'Materials and Methods' section of a scientific paper? Add a note on importance of measurements. **[20]**

Q6) How to write discussion section of scientific paper? Discuss evidence or data conclusion. **[20]**

Q7) a) Describe the outline of scientific paper. **[10]**

b) Explain different types of sentence structure. **[10]**

Q8) Attempt any four from the following: **[20]**

a) Language as a communication.

b) Explain syntax

c) State any five antonyms

d) Styles of citation

e) Explain Tautology



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

P1407

[5433]-13

M.Sc. - I

ZOOLOGY

**ZY - 103 : A) Freshwater Zoology B) Statistical Methods
(2008 Pattern) (Semester-I)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books*
- 2) Answer any two questions from each section.*
- 3) All answers carry equal marks*
- 4) Draw neat labelled diagram wherever necessary*

SECTION-I

A) Freshwater Zoology

Q1) Explain the general life cycle of Anurans with a neat diagram. Add a note on tadpole as important herbivore of freshwater ecosystem. **[20]**

Q2) Explain the process of biomagnification in aquatic ecosystems with reference to Mercury pollution. **[20]**

Q3) Discuss the protective adaptation of freshwater rotifers. Add a note on their food and feeding habits. **[20]**

Q4) Write notes on any four **[20]**

- a) Role of molluscans as food.
- b) Diagnostic features of tadpole shrimps
- c) Importance of ephemeral water bodies.
- d) Adaptions in freshwater reptiles.
- e) Role of pH in freshwater ecosystems

P.T.O.

SECTION-II

B) Statistical Methods

Q5) a) Define the following terms:

i) class width

ii) class frequency

iii) type I error.

[6]

b) The following data gives blood serum cholesterol levels of 10 patients: 235, 224, 250, 284, 250, 241, 263, 245, 250, 257. Compute standard deviation.

[6]

c) On an average, daily 4 persons get emergency admissions in US hospital with heart problems. Assuming Poisson distribution, find the probability that there are (i) Exactly 5 admissions (ii) less than 4 admissions in US hospitals due to emergency heart problem on a given day.

[8]

Q6) a) Define a Binomial distribution and state its mean and standard deviation.[6]

b) The following data is about height of plants (inches) in a garden:

Height of plant:	0-8	8-16	16-24	24-32	32-40
------------------	-----	------	-------	-------	-------

Number of plants;	10	15	21	17	8
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Draw histogram and frequency polygon .

[6]

c) The following data gives amount injected (X) in gms and peak area observed (Y) in sq mm. in a compound when chromatographed on GC column:

X:	0.1	0.3	0.4	0.5	0.6	0.8	0.9
----	-----	-----	-----	-----	-----	-----	-----

Y:	19	27	35	42	53	64	79
----	----	----	----	----	----	----	----

Find covariance between X and Y and comment on the nature of correlation between them.

[8]

Q7) a) Define correlation between 2 variables, also state different types of it. [6]

b) A sleep inducing drug has to be tested for its efficacy based on the following data of number of hours of sleep without drug (X) and with drug (Y) given to a set of 8 persons on a normal day. Test at 5% level of significance whether the drug is effective in increasing average number of hours of sleep.

X	7.9	7.5	7.3	6.9	6.7	7.0	7.2	6.8
Y	8.1	7.9	7.2	7.2	6.8	7.4	7.1	7.4

[8]

c) In an experiment on pea breeding, out of 1600 seeds, 918 were RG, 290 were WG, 312 were RY and remaining were WY. Test at 5% level of significance whether this experiment fits the Mandel's theory, according to which, this ratio should be 9:3:3:1 respectively. [6]

Q8) a) Draw Pie diagram for the data given below of lunch sale: [10]

Item	Sandwiches	Beverages	Soups	Desserts	Chinese
Sales(%)	30	10	15	10	35

b) The length of human pregnancies are approximately normally distributed with mean $\mu=250$ days and standard deviation $\sigma = 12$ days. What proportion of pregnancies last for

i) less than 245 days

ii) between 242 and 256 days? [10]



Total No. of Questions : 8]

SEAT No. :

P1408

[5433]-21

[Total No. of Pages : 2

M.Sc.

ZOOLOGY

ZY - 201 : A) Developmental Biology

B) Comparative Animal Physiology

(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*

SECTION - I

A) Developmental Biology

Q1) Describe in detail the pattern formation in *Drosophila*.

Q2) Describe the changes occurring in the sperm head during acrosome reaction and comment upon the molecular strategy to ensure monospermy.

Q3) What is neural competence? Describe the molecular signalling during neural induction.

Q4) Write short notes on any two of the following:

- a) Programmed cell death.
- b) Organizers in frog.
- c) Fate maps in chick embryo.
- d) Synthesis and storage of maternal transcripts.

P.T.O.

SECTION - II

B) Comparative Animal Physiology

- Q5)** Explain the process of urine formation in mammalian kidney.
- Q6)** Describe the ultrastructure of striated muscle and explain the mechanism of contraction.
- Q7)** Compare the ventilation associated with gills and lungs.
- Q8)** Write short notes on any two of the following:
- Synapse.
 - Cardiac output.
 - Hyper-osmotic regulation.
 - Mechanism of hormonal action.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1409

[5433]-22

M.Sc. - I

ZOOLOGY

ZY - 202: A) Molecular Biology

B) Cell Biology

(2008 Pattern) (Semester-II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt two sections.*
- 2) *Answer any two questions from each section.*
- 3) *Answers to the two sections should be written in separate answer books.*
- 4) *All questions carry equal marks.*
- 5) *Neat diagrams must be drawn wherever necessary.*

SECTION- I

A) Molecular Biology

Q1) Explain in brief the process of replication in prokaryotes and add note on role of different proteins involved in it. **[20]**

Q2) a) Describe eukaryotic genome organization. **[10]**

b) Explain in brief physical properties of DNA. **[10]**

Q3) Explain in detail the mechanism of prokaryotic transcription. Add a note on protein involved in it. **[20]**

Q4) Write notes on the following. **[20]**

- a) Ribosome
- b) Retrotransposons
- c) Globin gene family
- d) Human Genome Organization Project (HUGO)

P.T.O.

SECTION-II

B) Cell Biology

Q5) Explain in detail structure of plasma membrane receptors and their functions in signal transduction with suitable example. **[20]**

Q6) What is cell cycle? Explain in detail its various phases and add a note on mechanism of its regulation. **[20]**

Q7) a) Describe the ultrastructure of nucleus and add a note on organization of nuclear lamina **[10]**

b) Explain in detail structure and function of Endoplasmic reticulum. **[10]**

Q8) Write short notes on:. **[20]**

a) Ribosome

b) Microinjection and Electroporation

c) Ultrastructure and molecular organization of centriole

d) Electron microscopy



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages : 2

P1410

[5433]-23

M.Sc. - I

ZOOLOGY

Zy-203 : A) Biochemical Technique OR Ichthyology

B) Endocrinology

(2008 Pattern) (Semester-II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Answer any two questions from each section.*
- 3) *Answer to the two sections should be written in separate answer books.*
- 4) *All questions carry equal marks.*
- 5) *Neat diagram must be drawn wherever necessary.*

SECTION -I

ZY —203 A) Biochemical Techniques

Q1) Give the principle, working and application of ultracentrifuge. **[20]**

Q2) a) Explain methods for DNA Sequencing. **[10]**

b) Describe principle and functioning of Manometry. **[10]**

Q3) a) Give detail account of atomic absorption spectrometry and its application. **[10]**

b) Give principle, working and application of absorption chromatography. **[10]**

Q4) Write short note on - **[20]**

- a) GM Counter.
- b) Respiratory quotient determination.
- c) Use of isotope in biology.
- d) Electrofocussing.

OR

A) Ichthyology

Q5) Write a note on male and female reproductive organs in fishes. **[20]**

Q6) Describe the various endocrine organs and their functions in fishes. **[20]**

P.T.O.

Q7) Describe structure and functions of gills. Add a note on role of air bladder in respiration. [20]

Q8) Write short note on - [20]

- a) Anadromous fishes.
- b) Parental care in fishes.
- c) Chondrichthyes
- d) Phylogeny of fishes

SECTION - II

ZY —203 B) Endocrinology

Q9) What are hormone receptors? Explain the plasma membrane receptors. [20]

Q10)a) Explain the role of hormones in calcium metabolism. [10]

b) Give a detail account of osmoregulatory hormones. [10]

Q11) Explain signal transduction cascade with respect to hormone action. [20]

Q12) Write short note on any two of the following - [20]

- a) X and Y organ in crustacea.
- b) Hypothalamo hypophysiotropins.
- c) Role of ADH in osmoregulation.
- d) Gastrointestinal hormones.



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :6

P1411

[5433] - 31

M.Sc. - II

ZOOLOGY

ZY - 311 : Entomology - I

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) Attempt any four questions.*
- 2) Draw neat labelled diagrams whenever necessary.*
- 3) All questions carry equal marks.*

Q1) Describe the interrelationship of insects with other arthropods.

Q2) Discuss different types of mouth parts met with in insects.

Q3) Describe male reproductive system in insects and add a note on seminal transfer.

Q4) Give the distinguishing characters of following insect orders with at least two examples from two families.

- a) Thysanura
- b) Orthoptera
- c) Hemiptera
- d) Coleoptera

Q5) Describe in detail the tracheal system of a generalized insect.

P.T.O.

Q6) Describe the fundamental plan of a generalized insect leg and an account of various leg modifications found among insects.

Q7) Describe structure and functions of endocrine glands in insects.

Q8) Write short notes on:

- a) Wing coupling
- b) Types of antennae
- c) Abdominal appendages
- d) Filter chamber



Total No. of Questions :8]

P1411

[5433] - 31

M.Sc. - II

ZOOLOGY

ZY - 312 : Genetics - I

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) Attempt any four questions.*
- 2) All questions carry equal marks.*
- 3) Neat labeled diagrams must be drawn wherever necessary.*
- 4) Use of calculator is allowed.*

Q1) What is speciation? Explain the role of selection and natural mutations in speciation.

Q2) Write note on the following:

- a) Chromosome probes.
- b) Flow sorting.

Q3) On which populations do 'r' and 'k' selection strategies operate? Explain the characteristics of the two strategies.

Q4) a) Write a note on Gene therapy

- b) What is the relationship between relative fitness and selection co-efficient?

Q5) Write short note on:

- a) RFLP.
- b) Application of Reverse Genetics.

Q6) “Genetic Polymorphism leads to evolution” - Justify the statement with respect to chromosomal variations.

Q7) Explain the methodologies employed in gene localization on chromosome.

Q8) Why is it valuable to have high degree of heterozygotes in a population.



Total No. of Questions :8]

P1411

[5433] - 31

M.Sc. - II

ZOOLOGY

ZY - 313 : Physiology - I

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) Attempt any four questions.*
- 2) All questions carry equal marks.*
- 3) Draw neat diagrams wherever necessary.*

Q1) What is animal electricity? Explain the structure and function of electroreceptor and electroorgan.

Q2) What is biological clock? Explain endogenous and exogenous clock hypothesis with suitable examples.

Q3) What is action potential? Explain the role of various ion channels.

Q4) What is buoyancy? Explain the physiological role of various gas floats in floating.

Q5) Explain the respiratory and cardiovascular responses of animals adapted in deep sea.

Q6) What is excretion? Explain the organs of excretion and urine formation in various animals.

Q7) a) Explain metabolic rate in relation to body size in mammals.

b) Explain the mechanism of osmoregulation in terrestrial vertebrates.

Q8) Write short notes on:

a) Bioluminescence

b) Glycolysis

c) Na^+ - K^+ pump

d) Moist skin animals



Total No. of Questions : 20]

SEAT No. :

[Total No. of Pages : 3

P1412

[5433]-32

M.Sc. - II

ZOOLOGY

ZY - 321 : Immunology

ZY - 322 : Environmental Biology

ZY - 323 : Fundamentals of Systematics

ZY - 324 : Aquaculture

ZY - 325 : Insect Ecology

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two optional courses from ZY - 321 - ZY - 325.*
- 2) *Answer to the two courses should be written in separate answer book.*
- 3) *Attempt any two questions from each optional course.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *All questions carry equal marks.*

SECTION - I

(ZY - 321 : Immunology)

Q1) Explain in detail humoral immunity.

Q2) What is vaccination? Explain the various types of vaccine.

Q3) a) Explain the principle and applications of Immunofluorescence and RIA.
b) What is cell mediated immune response? Add a note on T-cell receptors.

Q4) Write note on any two:

- a) Hybridoma and its application.
- b) Autoimmune diseases.
- c) Lymphoid tissues.

P.T.O.

SECTION - II

(ZY - 322 : Environmental Biology)

Q5) Define Pollution. Describe the types of Air Pollutants.

- Q6)* a) Describe any two major ecosystem.
b) Describe the impact of human on natural environment.

Q7) Describe various types of environmental degradation.

Q8) Explain the effect of Sewage Pollution on living organism.

SECTION - III

(ZY - 323 : Fundamentals of Systematics)

Q9) Explain in detail morphotaxonomy and cytotoxicity.

Q10) Explain the various methods of preservation and curation for taxonomic procedure.

Q11) Explain the following:

- a) Kingdom.
- b) Phylum.
- c) Species & subspecies.
- d) Deme.

- Q12)* a) Write a note on taxonomic key.
b) Explain the theories of biological classification.

SECTION - IV

(ZY - 324 : Aquaculture)

Q13) Describe the types of prawns and culturing of fresh water prawns.

Q14) Explain fishing techniques, preservation and processing of fish.

Q15) Describe the process of pearl formation. Add a note on collection and rearing of oysters.

Q16) Write short notes on :

- a) Induced breeding.
- b) Crab culture.
- c) Fish diseases.
- d) Aquaculture as applied science.

SECTION - V

(ZY - 325 : Insect Ecology)

Q17) Write a note on the relationship between vascular plants and insects.

Q18) Explain the effect of biotic and physical factors of environment on Insects.

Q19) Write a note on social insects with example.

Q20) Write short notes on :

- a) Insect predators of vertebrates.
- b) Various modes of feeding in insects.
- c) Insect parasites.
- d) Aquatic insects.



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages : 2

P1413

[5433]-33

M.Sc. - II

ZOOLOGY

ZY - 331 : Parasitology

ZY - 332 : Insect Physiology and Biochemistry

ZY - 334 : Genetic Toxicology

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Answers to the two sections should be written in separate answer books.*

SECTION - I

ZY - 331 : Parasitology

Q1) What is antibody synthesis? Describe the serological process to demonstrate specific antigens of *Entamoeba* and *Plasmodium*.

Q2) Describe the life cycle, Pathogenecity, treatment and control measures of *Leishmania* sps. and *Ancylostoma* sps.

Q3) Define Immunodiagnostic assay. Explain use of immunodiffusion technique and indirect haemagglutination test.

Q4) Write short notes:

- a) *Schistosoma* sp.
- b) Describe Radioimmunoassay
- c) Parasitism and altruism
- d) Surface antigen Diversity

P.T.O.

SECTION - II

ZY - 332 : Insect Physiology & Biochemistry

- Q5)** Describe the structure and physiology of flight muscles.
- Q6)** a) Describe the structure and functions of malpighian tubules.
b) Describe the structure and functions of juvenile hormone.
- Q7)** What is integument? Describe its structure and functions.
- Q8)** Explain the role of fat bodies in the carbohydrate metabolism.

SECTION - III

ZY - 334 : Genetic Toxicology

- Q9)** *Drosophila* is a test organism to study mutations. Explain.
- Q10)** a) Explain the principle and applications of Ame's test.
b) "Tautomeric shift of nitrogen bases of DNA leads to mutations". Justify.
- Q11)** Write notes:
a) Mutagenesis and carcinogenesis
b) Micronucleus test
- Q12)** What is toxicology? Explain the various subdivisions of toxicology and comment on importance of genetic toxicology.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

P1414

[5433]-41

M.Sc. - II

ZOOLOGY

**ZY - 411 : Entomology - II
(2008 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

Q1) Explain in detail the process of fertilization in insects.

Q2) What do you mean by blastokinesis? Describe the process of blastokinesis in insects with suitable examples.

Q3) Explain in detail oviposition habits in insects.

Q4) Write notes on (any two):

- a) Telotrophic ovariole
- b) Parthenogenesis
- c) Development of alimentary canal in insects
- d) Types of pupae

Q5) What is the principle of Biological control? With illustrated examples describe role of Biocontrol agents for controlling agricultural pests.

Q6) Explain in detail economics of pest control.

Q7) Describe the Knipling's model for male sterile-technique.

Q8) Write notes on (any two):

- a) Ageing in insects.
- b) Hadorn's experiments with imaginal discs.
- c) Pesticidal hazards and antidotes.
- d) Types of damage caused by insect pests.



P.T.O.

Total No. of Questions : 8]

P1414

[5433]-41

M.Sc. - II

ZOOLOGY

ZY - 412 : Genetics - II

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

Q1) Explain the following Genetic Markers. **[20]**

- | | |
|---------|---------|
| a) SNP | b) STR |
| c) VNTR | d) RFLP |

Q2) a) Explain the genetic basis of TCR diversity. **[10]**

b) Describe the role of Recombination activating genes and recombination signalling sequences. **[10]**

Q3) Discuss the genetic basis of circadian rhythms. **[20]**

Q4) Explain the role of cancer critical genes in cancer formation. **[20]**

Q5) Define QTL. Discuss strategy of their use by giving an example of a psychiatric disorder. **[20]**

Q6) a) Explain the molecular and biochemical basis of Tay-Sach's disease. **[10]**

b) Explain the molecular genetics of DMD. How are the genes for DMD localized by genetic linkage analysis. **[10]**

Q7) Explain the genetic basis of cell division control. **[20]**

Q8) a) Write notes on: **[10]**

- i) Use of pedigree studies in human genetics.
- ii) Penetrance and variable expressivity.

b) Explain dosage compensation in humans. **[10]**



Total No. of Questions : 8]

P1414

[5433]-41

M.Sc. - II

ZOOLOGY

ZY - 413 : Animal Physiology - II

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

Q1) Explain the Nernst equation. Add a note on Goldman – Hodgkin Katz equation.

Q2) What is sensory physiology? Explain the structure of ear and physiology of hearing.

Q3) What is Nutrition? Explain the function of intrinsic nerve flexes and extrinsic nerve flexes.

Q4) Explain the anatomy of heart. Add a note on electrical activity of heart pace makers and spread of cardiac coupling.

Q5) Explain the skeletal muscle fiber types. Add a note on contractile machinery of smooth muscle.

Q6) a) Role of arteries as a pressure reservoir.
b) Explain the role of central receptors in respiration.

Q7) a) Role of ions for excitation and conduction of nerve signal.
b) Write a note on neuronal control of heart.

Q8) Write Notes on:
a) Anatomy of respiratory system.
b) Excitation – contraction coupling.
c) Composition of blood.
d) Types of receptors.



Total No. of Questions : 20]

SEAT No. :

[Total No. of Pages : 3

P1415

[5433]-42

M.Sc. - I

ZOOLOGY

(Semester - IV)

ZY - 421 : Animal Tissue Culture (2008 Pattern)

ZY - 422 : Pollution Biology

ZY - 423 : Marine Biology

ZY - 424 : Bacterial Phage and Genetics

ZY - 425 : Medical Entomology

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Answers to the two sections should be written in separate answer books.*

SECTION - I

ZY - 421 : Animal Tissue Culture

Q1) What is cell lines? Describe genetic characterization of cell lines.

Q2) a) Describe sterilization methods used in Animal tissue Culture.

b) Describe methods of organ culture.

Q3) What is tissue disaggregation? Give the various types of tissue disaggregation.

Q4) Write short notes on:

a) Nomenclature of cell lines

b) Working and application of Laminar air flow

P.T.O.

SECTION - II

ZY - 422 : Pollution Biology

- Q5)** What is Pollution? Describe the sources and effects of air pollution?
- Q6)** Describe in detail the various components of Biosphere?
- Q7)** Describe pesticide pollution. Explain its sources and effects on non-target Animals?
- Q8)** Write short notes on:
- Eutrophication
 - Handling and Management of Biomedical waste.
 - Photochemical smog
 - What is bioassay? Explain Pollutant bioassay using FISH.

SECTION - III

ZY - 423 : Marine Biology

- Q9)** What is marine environment? Classify and describe the oceanic zones.
- Q10)** Describe in detail the components of a seafloor with the help of a flow chart diagram.
- Q11)** What are marine resources? Describe Algal and mineral resources.
- Q12)** Write notes on the following:
- Control measures of biofouling.
 - Marine animal diversity.
 - Production of marine sediments.
 - Factors for primary production in ocean.

SECTION - IV

ZY - 424 : Bacterial and Phage Genetics

Q13) How is genetic switch from lysogeny to lytic cell effected in Lambda bacteriophage? Explain the role of repressor protein in maintenance of lysogenic state.

- Q14)** a) Explain the isolation of autotrophic mutants.
b) Explain the rolling circle model of DNA replication.

Q15) Explain T phages? Explain the organization of genes and replication of T₇ bacteriophage.

Q16) Write short notes on:

- a) Retrovirus
- b) Chromosomal mapping
- c) Reverse transcriptase
- d) MS 2 replication

SECTION - V

ZY - 425 : Medical Entomology

Q17) Describe role of insects in veterinary entomology with reference to disease spread.

Q18) Give an account of importance of insects in relation to human health.

Q19) Explain medical importance of head louse, Anopheles mosquito, bed bug and cat flea.

Q20) Write notes on:

- a) Trypanosomiasis
- b) Bartonellacea
- c) Carrions disease
- d) Cloth moth



Total No. of Questions : 16]

SEAT No. :

[Total No. of Pages : 3

P1416

[5433]-43

M.Sc. - II

ZOOLOGY

ZY - 431 : Physiology of Mammalian Reproduction

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

ZY - 433 : Biodiversity Assessment

ZY - 435 : Apiculture

(2008 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Answer any two questions from each section.*
- 3) *Answers to the two sections should be written in separate answer books.*
- 4) *All questions carry equal marks.*
- 5) *Neat labeled diagrams must be drawn wherever necessary.*

SECTION - I

ZY - 431 : Physiology of Mammalian Reproduction

Q1) Explain male reproductive system in detail and add a note on testicular hormones.

Q2) a) Explain hormonal control in lactation.

b) What are contraceptive devices? Mention its role in control of reproduction.

Q3) a) Explain types and functions of placenta.

b) Discuss oestrous cycle in mammals.

Q4) Write notes on (any two):

a) Genetic disorders

b) Puberty

c) Hormones in pregnancy

d) Invitro fertilization.

P.T.O.

SECTION - II

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

- Q5)** Explain the characters, types and location of connective tissue.
- Q6)** Explain the problems encountered while sectioning and suggest the remedies for it.
- Q7)** Explain the principle, procedure and applications of PAS reaction.
- Q8)** a) Explain the histochemical detection of mucopolysaccharides.
b) Write a note on Immunohistochemistry.

SECTION - III

ZY - 433 : Biodiversity Assessment

- Q9)** Discuss the diversity and adaptation in animals with respect to their habitat.
- Q10)** Enlists all the invertebrates phyla, Explain the classification of phylum Arthropoda with suitable examples.
- Q11)** Define biosphere and explain global biodiversity hotspots.
- Q12)** Write short note on:
- Commensalism
 - Zoogeographical regions
 - Aquatic adaptations
 - Natural resources

SECTION - IV

ZY - 435 : Apiculture

Q13) Describe bee keeping equipments and techniques for establishment and harvesting of a colony.

Q14) Describe scope and importance of bee keeping as a business.

Q15) Explain bee-plant relationship. Add a note on significance of bee pollination services.

Q16) Write short notes on:

- a) Royal jelly
- b) Bacterial diseases of bee
- c) Foraging behavior of bee
- d) Division of labor

